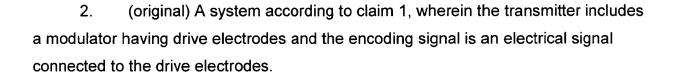
Amendments to the Claims

- 1. (currently amended) An optical transmission system <u>for transmitting an</u> optical signal with an OCDMA code defined by a chip rate, comprising:
- (a) an optical transmitter including an input for receiving an encoding signal and an a drive-signal-based encoder arranged to encode an optical signal with an electrical encoding signal at the chip rate, wherein the encoder is reconfigurable to provide [any one of] a plurality of encoding signatures codes according to the encoding signal;
- (b) a transmission link for conveying the encoded optical signal from the optical transmitter; and
- (c) an optical receiver comprising a grating decoder connected to receive the encoded optical signal from the input and decode the encoded optical signal, the grating decoder incorporating a decoding signature matched to one of the encoding signatures so as to decode the encoded optical signal when encoded with the matched one of the encoding signatures superstructure fiber Bragg grating configured as a matched filter to recognise one of the codes.



- 3. (original) A system according to claim 2, wherein the modulator is a phase modulator.
- 4. (original) A system according to claim 2, wherein the modulator is an amplitude modulator.
- 5. (original) A system according to claim 2, wherein the modulator is one of: an electro-acoustic modulator; and an electro-optic modulator.



- 6. (original) A system according to claim 1, wherein the transmitter includes an optical delay line encoder.
- 7. (original) A system according to claim 6, wherein the optical delay line encoder comprises one of: a fiber coupler, a fibre grating, a planar lightwave circuit (PLC) and an arrayed waveguide grating (AWG).
- 8. (original) A system according to claim 1, wherein the transmitter includes an electrically driven laser source and the encoding signal is an electrical signal connected as a drive current to bias the laser source.
- 9. (currently amended) A system according to claim 1, wherein the grating decoder additionally incorporates a filtering function to compensate for signal distortions that result from the application of the encoding signal to the optical signal induced by the encoder.

10-12. Canceled

- 13. (original) A system according to claim 1, wherein the grating decoder is configured to decode a spread-spectrum encoded optical signal.
- 14. (currently amended) A receiver system according to claim 1, wherein the grating decoder is configured to decode an OCDMA encoded optical signal a header in a packet-switched system.
- 15. (currently amended) An optical transmission A method for transmitting an optical signal with an OCDMA code defined by a chip rate, the method comprising:
- (a) encoding an optical signal with <u>an electrical encoding signal at the chip</u>

 <u>rate using a drive-signal-based encoder configurable to provide a plurality of codes any</u>

 <u>one of a plurality of encoding signatures</u> according to an the encoding signal;
 - (b) transmitting the encoded optical signal over a transmission link; and
 - (c) decoding the encoded optical signal using a grating decoder incorporating

a <u>superstructure fibre Bragg grating configured as a matched filter to recognise one of the codes</u> decoding signature complementary to a matched one of the encoding signatures.

16. (currently amended) An optical transmitter comprising:

an optical source for generating an optical signal modulated with a contentbearing signal and having a predictable distortion characteristic induced during modulation of the optical signal, wherein the optical signal is modulated by encoding with an electrical encoding signal; and

a <u>superstructure fibre Bragg</u> grating decoder incorporating a filtering function configured to compensate for the distortion characteristic and arranged to process the optical signal to compensate for the distortion characteristic.